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The Operational Implications of Assuring Access

LCDR W. J. Nieuwsma, USN

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This paper is submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Strategy and Policy. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature William Nieuwsma

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The Operational Implications of Assuring Access

Introduction

The Navy's operational concept of "Forward...From the Sea" is the Navy response to the changing global military landscape, one which presents the warfighting Commanders-in-Chief (CINC's) with guidance that the U. S. Navy will "decisively influence events ashore, anytime, anywhere."¹ Tantamount to the capacity to influence is the Navy's ability to gain accessibility to littoral areas of interest. The idea of **assuring access** to our primary battlespace domains is fundamental to warfighting, yet not well defined. The warfighting domains around which our military services are loosely based (and amply overlap) are land, air, sea, space, and cyberspace (a relatively new domain).² Of the primary warfighting domains the Navy is primarily concerned with the last three. Sea, space, and cyberspace are less encumbered by geographic borders than the land and air domains, and are familiar domains to the Navy.³ The domains of sea, space, and cyberspace are strongly interrelated, requiring dominance to assure access. Access assurance is examined in a historical context that relates directly to present and future military challenges. Future military competitors to the United States have unprecedented access to technology which, when used together with a clever strategy, may deny the U. S. access to the contested littorals and effectively hinder a CINC's ability to decisively influence events ashore. Adequate and capable naval forces in the contested littorals have the ability to shape enemy disposition and

¹ Admiral J. Johnson, USN, "Anytime, Anywhere: A Navy for the 21st Century," *Proceedings*, November 1997, p. 49.

² Speech by VADM A. K. Cebrowski, "Sea, Space, Cyberspace...Borderless Domains" presented at the 1999 Pacific Oceans Law Conference, Honolulu, HI 15 February 1999.

³ Ibid.

options, giving the CINC not only operational options but strategic flexibility as well. Forces that are either ill suited to the task or too thinly spread will permit enemy options and lose the advantages that speed and initiative can provide. The consequences of an inability to assure littoral access will be a narrowing of operational and strategic military options to "all or nothing" sizes of forces required. These options may not suit our national policies and dim our status as "superpower".

Definition of Assured Access

We may define "assured access" as "the guaranteed right to approach, enter, and operate within littoral areas".⁴ Accessing the world's littoral areas has been a prime concern to the U.S. Navy from its beginning, taking the fight to the coasts of the Barbary pirates. The guarantee comes from the Navy's breadth of capabilities that it brings to bear. A more operationally urgent definition for the combatant command CINC is "the guaranteed ability to gain and sustain the use of the contested littoral environment for power projection and forward maritime presence." Not stated but inherent is the ability to gain and sustain access at the time, place, and for the duration of our choosing. The meaning of the definition is that naval forces must be able to overcome any attempted access denial strategies that a potential foe may enact.⁵ To the CINC, this also means that naval forces must be able to assure access in the warfighting domains that concern the Navy most without a weakness that may be exploited.

⁴ Webster's New World Dictionary (2nd College Edition), 1980, William Collins Publishers, Cleveland, OH.

The Importance of Access

Of the five domains, the Navy's interest lies within the sea, space and cyberspace domains. Assuring access to these domains is a primary product line of the U. S. Navy, and it can be shown that they are highly interrelated to the degree that great success in one domain may facilitate dominance in the other two. The more insidious case is the converse, where weakness in one of the three can weaken the other two and ultimately prevent naval forces from assuring access to the littorals for the duration required to accomplish assigned tasking. Weakness or a failure to dominate one or more domains is a function of both assessed risk (the perceived match of own forces against enemy capabilities) and resolve. Task group commanders must assess comparative strengths and weaknesses together with enemy resolve when formulating operational plans. If the perception is that proposed operations pose high risk to friendly forces while in close, operational forces will be moved back to an acceptable safe distance. The ability to observe and act or react with decisive speed will be correspondingly reduced. The area denial strategy forces the operational commander to employ forces in a manner that has been dictated and inhibits initiative. The enemy will have turned our Network-Centric philosophy against us by locking out our primary course(s) of action and denying us the benefits of speed of action.⁶ The resulting action will be that of an expeditionary campaign to reassert our littoral presence first, then influence events.

For our adversaries who are actively planning or using an anti-access or area denial strategy, perception plays a pivotal role. A strategy in which the United States and its coalition partners have been pushed in military action is clearly a

⁵ Mahnken, Thomas G, "Deny U. S. Access?" *Proceedings*, September 1998, pp. 36-39.

⁶ VADM A. K. Cebrowski, USN and John Garstka, "Network-Centric Warfare," *Proceedings*, January 1998, p.

failure for an opponent. In this case the United States has deemed the object to be worth the risk of losing personnel and equipment, albeit minimized to the maximum extent possible. The best outcome for an adversary is one in which their political, military, economic, or cultural goals are being met while a threat to United States forces and/or Allied forces prevents or delays intervention. An adversary must be able to adroitly mix *perceived risk* with *actual risk* to naval forces to adequately leverage an anti-access strategy. The time delay of United States action is the independent variable an opponent seeks to maximize, as our resolve tends to decrease as time goes on. Conversely, our nation seeks to deter such disagreeable action through a range of influencing factors. When military deterrence does not adequately compel our adversaries to alter strategies, forward-deployed naval forces must be able to swiftly engage them.

Historical Implications

Access denial or anti-access strategies and subsequent counters have numerous historical precedents. Some reoccurring themes are:

- Operational risk is a two-sided affair that involves a combination of perceived risk versus actual risk in the mind of the commander.
- "Fortune favors the brave"⁷ (and the timely), but does not favor the timid.
- Frequently a lower technology application is the mechanism by which littoral access may be denied.⁸

The Spartans never breached the walled area around Athens, relying instead upon overseas campaigns as a mechanism for victory in the Peloponnesian War. To win,

⁷ Pliny the Elder, 350 AD, *Bartlett's Familiar Quotations*, 9th Ed., Boston: Little, Brown, 1901.

Sparta evolved their force from a dominant land power to an expeditionary, sea-capable one in order to assail Athenian littoral holdings. Today many low-cost, low-risk alternatives to major force restructuring are available to those nations seeking to negate an opponent's technological superiority; the future should be no different. Future operational commanders must be postured to anticipate such measures as credible threats to technologically superior forces. It is not just any Goliath that CINC's should keep their eye on; it's also David...

Western River Campaign - American Civil War

The Civil War provided an opportunity to put into broad practice several key technologies developed over the past half-century: steam power, screw propulsion, and plate armor. Union Rear Admirals David Farragut and David Dixon Porter were tasked to access and control the Mississippi River in order to isolate fertile Texas, Arkansas and Louisiana from the rest of the Confederacy. Reduced Confederate resources could not produce a Navy to match the numbers of the Union fleet, so they resorted to a mix of low and high technology alternatives to deny access to their rivers and inland cities. One was an ancient but effective ploy of floating burning rafts toward the enemy ships. The second strategy was the advancement of the mine (known then as the torpedo). Steam-driven, armored ironclads were a third. During the Battle of Mobile Bay the Union task force lost one of its two most capable and modern ironclads (USS TECUMSEH) to a mine in the opening minutes of the battle.⁹ In this battle, the Confederate forces had constructed a formidable defense in depth consisting of mines, four forts, and a large ironclad

⁹ For an excellent discussion of the successful emergence of low-end competition to firmly established businesses, see Clayton Christensen's Disruptive Technologies (Harvard Press, 1995).

ram (CSS TENNESSEE). With the mines and forts constraining his fleet's maneuverability, Admiral Farragut accepted the risk of leading the fleet past the minefield to engage TENNESSEE and her escorts. It was a calculated gamble based upon his perception of an overall low actual risk from mines. Farragut's bold decision was based upon his assessment of actual risk and the strategic results of a swift victory, knowing the importance of severing Confederate naval operations on the Mississippi River to both the nation and its leadership. To assure access to this vital littoral area, Farragut required dominance in the Civil War-era equivalents of sea, space (elevated sensors in the form of balloon observations)¹⁰, and cyberspace (signaling). He had only sea dominance. Farragut was initially unable to communicate his guidance on avoiding the minefield. As his lead (minesweeping capable) vessel backed down to avoid possible mines, the attack stalled and fixed some of the vessels within heavy gun range of the forts (prompting the famous utterance "Damn the torpedoes! Full speed ahead!"). Technology of the time did not permit such immediate and thorough communication between ships. Deprived of information dominance, the Union fleet had to accept greater actual risk in avoiding the mine threat. Additional time taken to assess the threat and formulate a new concept of operations would have allowed the defense to reposition and reinforce. Delay could also have had adverse strategic implications for the Union, desperately in need of success somewhere. The joint operation with synchronized Army and Navy actions was a successful plan that reaped other rewards from its speed of completion (about 24 hours). Much of Farragut's and Porter's following successes in the campaign were the result of their swift operational movements and seizures,

⁹ After action report by D. G. Farragut, website

prompting Confederate defenders to field only partially completed ironclads or destroy them to prevent their capture.¹¹ Their speed of action contributed to reducing the actual risk they faced as the campaign continued. Final and complete control of the Mississippi River resulted in lost logistical avenues for the Confederacy and strained their already overtasked rail system.¹² The operational commander's decision to risk his fielded forces to counter an imposing area denial strategy bred success for additional river operations. These successes helped swing the outcome of the Western campaign towards the Union. Implications for today's operational commanders are that rapid battlespace dominance in littoral operations has a non-linear effect upon the campaign and major effect upon the outcome of a war.

North Sea – World War I

During World War I, the failure of the Allies to gain assured littoral access had strategic implications upon the course of the war, probably leading to an increased duration and countless untold additional lost lives. For Great Britain, use of the Grand Fleet for purposes other than major fleet engagements or blockade was not seriously considered; yet littoral operations held the key to decisively altering the war's events in the Allies' favor. Upon an inconclusive engagement between the British and German fleets in the Battle of Jutland, neither fleet was used for its intended Mahanian purpose for the rest of the war. British operational naval strategy evolved into a distant blockade with denial of sea lines of communication.

¹⁰ At the time, this method was utilized by the Union from ships in the James River (VA) to observe Confederate troop positions. Navy Historical website.

¹¹ Surdam, p. 126.

¹² Surdam, p. 127.

British naval leaders even went so far as to forbid movement of the Grand Fleet without sufficient destroyer and submarine escorts, and conceded German naval presence from Norway to Flanders.¹³ Even as the Western Front stagnated and casualties mounted, plans for peripheral naval operations to break the land stalemate continued to languish. Although Germany possessed a less capable fleet, its coastal defense-in-depth neutralized the superiority of the British fleet through a superior access denial posture and its perceived threat to the Grand Fleet. Submarines, torpedo boats, coastal artillery, spotting aircraft and Zeppelins were the low-cost asymmetric threats that the Royal Navy was not structured to overcome. Admittedly, Great Britain gave up access to the littorals in part because their distant blockade was still thought to be effective (and later proved to be). But the German littoral posture left them little choice and no opportunity to shorten the war.

The warfighting domain analogies can be used to illustrate how the British failure to dominate the sea domain prevented assured access to the Northwest coast of Europe and offered the Allies no options on the Western Front to affect the outcome of the war. This denial of coastal access led the Allies to shift their strategic emphasis and conduct peripheral operations in the Mediterranean Sea. The first focused upon the Dardanelle Straits and the disastrous Gallipoli campaign. An additional important point for operational commanders is the need to have the right balance of capabilities for littoral operations. The Allies could not balance their capital ship fleets with sufficient screening vessels to survive a torpedo tempest from submarines and torpedo boats while approaching the European coast. An amphibious landing was the only way to introduce maneuver and initiative to

¹³ Kennedy, pp. .

the Western Front, but the Grand Fleet was instead relegated to a strategic deterrence force.

Dardanelles – World War I

Failure to assure littoral access in Northwest Europe led the British to attempt to eliminate Turkey as a belligerent in order to gain access to the Black Sea.

Movement of foodstuffs and war materiel to and from the Black Sea through the Dardanelle Strait and swaying the neutral Balkan states to the Allied cause was a brilliant strategy that post-war historians felt would have ended the war sooner.¹⁴

Several factors contributed to the operations failure: the decision to initially use naval forces vice a joint force (a cabinet level decision), inability to solve a mobile target problem of Turkish mobile gun batteries, and poor minesweeping operations.

Although initial ship losses were heavy, the loss of the older ships was not materially significant; the task force commander's perceived risk at losing more ships halted the operation. Failure of the operation can be attributed to poor risk assessment both before and during the campaign. Unlike the Union's joint operations approach during the American Civil War, the Allied naval effort in the Dardanelles was flawed and never got better. The unfortunate momentum of a stinging loss of ships and men prevented dominance in the reconnaissance and awareness domains as risk aversion set in. Each task force commander (Carden, then de Roebeck) was unwilling to risk any other ships in an attempt to break through, even though a continuance by the Allied naval forces would probably

¹⁴ Bernadotte E. Schmitt and Harold C. Vedeler, "The Rise of Modern Europe: The World in the Crucible 1914-1919. Harper and Row, New York 1984. Pp. 114-115.

have meant victory.¹⁵ The inability to locate and destroy the Turkish mobile guns started a chain of operational failures for the Allies. A significant deception campaign successfully decoyed naval batteries into firing at false gun emplacements. Only after the Gallipoli landing did the British ensure adequate spotting planes and balloons were on hand, with the implication that the Allies failed to dominate the elevated sensing (space) domain. Lastly, knowledge of the precarious position of the Turkish defense was overshadowed by the ship losses in the minds of both Carden and de Roebeck. Dominance in the sea domain was conceded by the two commanders despite possessing far superior forces. This doomed the campaign and significantly altering the war's strategic landscape. Badly needed war materiel never reached Russia, who abandoned the Entente and later surrendered to the Bolsheviks. The three-week operational pause taken while waiting for additional ground forces to arrive gave fresh hope to the defenders, surrendered the advantages of speed of action, and prevented any chance of overcoming the failure to dominate the sea and space domains.

Access Denial in the Information Age

Today, we cannot envision a peer competitor or alliance that is our equal in the military arena. Knowing this, a potential foe nonetheless has many options for preventing CINC's from decisively influencing events ashore in their theaters without the high capital investment in force structure the United States spends. Part of this empowerment comes from our frequent National Command Authority guidance to conduct operations at the absolute lowest casualty rate possible. Another part is that weapons, sensors, and communications available on the open

¹⁵ Schmitt, pg. 116.

market are inexpensive and highly capable. Several high technology, cost effective options are available and would be immediately successful in an access denial strategy. But improved hardware is not the only avenue for exploiting our critical operational vulnerabilities. An opponent must leverage these vulnerabilities to create some operational "tradespace" with which to prevent or delay U. S. action. If the U. S. commits to military action, the opponent must then make the potential cost of our involvement very high to keep our political, social, and military resolve on the edge of uncertainty. In operational terms, the tradespace will be an adversary's territory (or physical space), military hardware, and military personnel for U. S. personnel and equipment casualties, plus time. In recent case of Kosovo, no ground was conceded by the Serbians in exchange for the air domain above 18,000 ft. The scale of exchange does not have to be equal or even nearly equal because of the value placed upon U. S. personnel and assets versus the national resolve of an adversary. The recent United States record of utilizing sea-launched cruise missiles at fixed overseas targets instead of manned air strikes is an example. The downing of a U. S. F-117 Stealth Fighter by Serbian air defense forces was undoubtedly worth the price of months of previously successful air strikes suffered by Serbian forces because of the doubt created in the minds of the strategic and operational commanders. Until official analysis becomes available, the number and flexibility of operations in the Balkan Theater that were curtailed or delayed can only be estimated. Serbian forces assuredly viewed the downing as a great success, despite the pounding they had previously absorbed. What they gained back was some time and some airspace.

Sea Denial

Modern anti-access postures in littoral areas revolve around an updated version of the previously mentioned coastal defense cases: mines, power projection capability, and maneuver elements. Today's power projection forces rely upon the cruise missile, while maneuver forces range from Iranian speedboats armed with rocket-propelled grenades to guided missile patrol boats. Submarines continue to pose as great a threat as they have during any modern war.

Defense against modern cruise missiles is on the wane as more capable, discriminating, and deadlier weapons are available than ever before. A lack of reliable defenses forces the naval task group commander farther from the littorals. Actions starting from farther out from the coast take more surveillance and reconnaissance time and reliance upon remote systems, significantly reducing the speed of response to detect enemy actions and act upon them. Mine countermeasure capability is improving, but not rapidly enough give a ship captain the confidence to maneuver at will in contested waters. A sophisticated mining effort requires significantly more operational capability and time to counter and restricts the mobility of friendly forces. The possibility of sophisticated and timely mining operations should not be underestimated by operational commanders. In the Dardanelle campaign, the mines that sank the battleships were thought to be floating mines, against which the Allies felt they had inadequate countermeasures.¹⁶ In reality, an additional mine line was laid down in an area where British battleships were observed maneuvering when firing. This action was accomplished by a Turkish freighter several nights prior to the sinkings after poor weather chased off a British picket destroyer. Also, with low mine production capacity, Turkey

routinely used recovered Russian floating mines to replace swept mines.¹⁷ Several significant implications for the operational commander can be seen from these vignettes. First, a failure to assure a significant all-weather access led to the discrete mining of an important local area. The method of using a non-combatant ship was an asymmetrical response. Using recovered mines belied any possible intelligence estimate of native mine production. All point to the necessity of close observation of the potential adversary and operating environment. Only close littoral presence allows close observation with today's sensors. When mining is coupled with modern anti-ship cruise missiles, a new version of the old problem of minefields covered by longer range striking power is encountered. Modern surface-to-air forces covering air approaches to minesweeping complete the defense.

Guided missile-equipped patrol boats pose significant danger to our larger naval forces based upon their reduced signatures, speed, and lethality per ton. Naval task forces must spend considerable energy and assets to screen our valuable multi-mission ships and aircraft. Patrol boats may launch a missile attack, then duck back within the cover of long range cruise missiles. While our platforms may be able to defeat today's missiles, we must expend our own ordnance and countermeasures to do so, growing the length of the logistical tail required for support. This, in turn, increases the force protection required, becoming a spiraling effort to assure littoral access. When the modern diesel submarine must be accounted for, this spiraling effect is greatly magnified. Many countries support their own submarine development or have purchased submarines.¹⁸ Although

¹⁶ C. F. Aspinall-Oglander, *Gallipoli*, vol. 1, London: William Heinemann, 1929, p. 97.

¹⁷ E. Michael Golda, "The Dardanelles: A Historical Analogy for Littoral Mine Warfare", *The Naval War College Review* (Summer 1998), Newport, RI.

¹⁸ (ref. to no. of countries w/ subs)

submarine forces are a considerable investment in capital and support, the effort required searching for and locating an adversary's submarines pale in comparison. In a typical Navy battle group, every non-tactical aircraft and escort ship is fully engaged in countering a submarine threat if present, degrading the ability to perform other missions. As with patrol boats, submarines would not have to stray far from shore to be effective in denying our access to enemy waters and can be protected by long range anti-surface and anti-air weapons.

Space Denial

In attempting to deny the CINC access to space in the littorals, an enemy is attempting to deny our strategic sensor capabilities and communications. Few, if any, nations are known to have deployable anti-satellite capability.¹⁹ A more likely scenario is a range of local options varying in magnitude. On the low end of the level of war would be deployment of Global Positioning System (GPS) jammers and Meaconing, Intrusion, Jamming, and Interference (MIJI) operations against our communications capabilities. On the upper end of the level of war would be the detonation of a nuclear device in the upper atmosphere to prevent our C⁴ISR²⁰ systems from properly functioning. A foe who does not rely upon space access for these functions on the operational level may find the odds better even though they would lose their own space access. Our current low capacity to reconstitute national assets in space along with their enormous price tag facilitates a "threat to use" posture to achieve space denial. Although loss or degradation of our radio frequency (RF)-based C⁴ISR systems does not prevent our ability to conduct

¹⁹ (FAS, Janes)

²⁰ Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance.

operations, it would severely hamper them and again cause a slowed down pace more suited to the defender. Few nations are capable of producing and launching a nuclear device with the inherent risk of mistaken intent of such a missile, and it is anticipated that such an operation would only be used if hostilities were imminent. A Fabian strategy should be preferred by an opponent to an escalatory one that the United States would surely dominate, even at a high cost.

Modern communication is not limited to modern radio and information links. The spread of wireless communications through cellular telephones poses an operational capability that is difficult to subdue. In an operational context, cell phones are a useful “workaround” to the loss of a military communication network. Signals may be intercepted and decoded, but special capabilities are needed to do this work, which are more suited to the tempo of peacetime surveillance than to operational action.

Cyberspace Denial

Cyberspace access may be denied through use of space denial operations, but a greater challenge is posed from within cyberspace itself. Computer network attacks through a variety of software agents, system overload, and other Information Operations (IO) are nearly impossible for the operational commander to deal with. The problem is that much of the vital command and intelligence information passing to and from a task force is currently limited to major naval platforms and bases, with few relays that information passes through. Information sharing efforts are well underway to facilitate tremendous shared awareness within

a naval task force²¹. This information-sharing infrastructure may be attacked through its network and must possess a robust network defense as well as be reconfigurable to prevent losing system-wide information sharing from the loss of one or two critical nodes. Flexible architecture and adherence to security protocols are currently the only way for operational commanders to assure cyberspace access. A loss of this access not only prevents our forces from achieving a position of Knowledge Superiority²² (KS), but also inhibits our ability to conduct our own IO. As many information issues are not under direct operational control or even CINC control, responsiveness by supporting forces and agencies is a must to maintain a tempo of operations that best accomplishes the operational tasking.

Very few potential enemies could position sufficient denial capability in great enough quantities to stop a joint United States or coalition effort to neutralize them. Our potential foes understand that their goals would be: 1) to prevent or delay operational action from occurring against them, and 2) to inflict even small losses to give the United States and its allies time to consider the price paid. Operational commanders must have at their disposal an assessment of actual risk to friendly forces together with an estimated resolve of an enemy.

Present Need for Assured Access

The degree to which operational forces will be able to act or respond to enemy action or latent capability depends directly upon our operational forces' overseas access. Historical evidence indicates that speed of action is essential to

²¹ See "Vision...Presence...Power: A Program Guide to the U.S. Navy 1999 (C4I), U.S. Navy Public Affairs online library (<http://www.chinfo.navy.mil/navpalib/policy/vision/vis99/v99-ch3e.html>).

success. The faster that a situation is known, the faster that capable forces share knowledge of the situation and command intent, and the faster that that forces are positioned to take action, the more options are available to the force commander. The fastest response is available when naval forces are in the littorals; the least is when they must deploy from home sanctuary. This is true for strategic, operational, and tactical levels of war (or peacetime engagement). For naval forces, assured access via the sea is presently constrained in several ways. The first is that an explosion of littoral missions and a shrinking fleet size have stretched thin the Navy's ability to cover areas in which we desire to exert influence. Today, many nations with which the United States is at odds have tailored their forces to threaten our operational vulnerabilities. Our combatant ships have significant multi-mission capability but are not robust enough to risk finding an 80-year old mine with. Mine problems encountered during Operation Desert Storm illustrate problems with mine countermeasures the U.S. Navy faces today. The deep breath taken by our naval surface forces after two mines were stuck dominated our naval mobility and affected other missions by the sheer effort placed upon detecting and avoiding mines. Additionally, our National Military Strategy, while based upon capable deterrence, is essentially defensive in nature. The implication for operational forces is that they are unlikely to be granted permission to conduct pre-emptive combat operations, the ultimate in speed of action. The sea access problem will be uphill in nature if the enemy is clever. Another shortfall is the paucity of theater-capacity sensors under operational control. At present, ranges of unmanned sensors are limited, as are loiter times required to assure access to real time surveillance (hours

²² Defined by N6 as "Shared understanding . . . to deter, shape or dominate the enemy", N6 Copernicus Requirements Working Group (CRWG) presentation, 02 Nov 99. KS is characterized by the depth of shared

as opposed to days or weeks). There is at present a capability gap between tactical sea-based sensors and space-based sensors in terms of range, mission time, sensor capability, and command authority. Space sensors are national assets that may be tasked by a CINC for specific, high-importance missions. Space access assurance is out of the hands of the task group commander, yet he is highly dependent upon space-based sensor information and communications. Most of a naval task force's ability to share knowledge in the present comes from cyberspace. Since the main information conduit is based upon satellites, there is at present a close tie-in between assurance of both space and cyberspace access. Operational forces that have not achieved or cannot assure continual access to both must be pushed out to the farthest edges of littoral areas to ensure adequate force protection, directly in opposition to the focus of their effort from as close to shore as possible. In this case, operational action must take place at arm's length from the littorals and it loses that vital element of speed. The same effect occurs when enemy military capabilities prevent our maneuvering close to shore due to their perceived vulnerability. In the case of cyberspace denial without space denial, a range of hindrances can occur. At the less severe scale is denial of information service that would require operational units to revert back to business being conducted the way it was only 5-10 years ago. At the severe end of the scale would be false information present that could be acted upon unknowingly. In between would be information that operational forces need (targeting, electronic emissions, etc.) that is unreliable, again leading to crucial delays or unwanted operational pauses.

Lastly, NCA course of action (COA) requirements may not match with a CINC's requirements. This situation can leave operational forces with a less

understanding and speed at which forces can act upon that understanding.

desirable COA or one more difficult to achieve. The ability to gain and sustain access may be strongly desirable operationally but diplomatically untenable. An example of this is the recent conduct of combat operations in Kosovo through the use of airstrikes alone and the exclusion of decisive ground forces as a matter of policy. Present operational commanders may find themselves planning and fighting more difficult scenarios than necessary.

Future Need For Access

Our growing dependence upon shared knowledge leads us to achieve knowledge superiority as a prerequisite to successfully conducting military operations. This dependence should only increase in the future and is the logical consequence of technological improvement. The question of whether assured access is required in the future is best answered by examining the implications of not assuring access. For operational naval forces, the question becomes whether sea/space/cyberspace access assurance in the littorals is required, and the implications of the inability to assure access in one or more of these domains. If information or knowledge superiority (IS/KS) is not achieved (either directly through theater sensors or indirectly through intelligence information), Clausewitz's "fog of war" increases and operational forces must operate with less certainty. Whether IS/KS becomes an information sharing problem or a sensing problem, operational decisions will either be made with less certainty, or delayed until certain decision criteria have been met. Action based upon uncertain knowledge, such as the World War II battles of Midway and Leyte Gulf, have succeeded, but only upon the narrowest of margins coupled with generous amounts of serendipity. Future operations may also meet an increasingly shrinking

tolerance for error in order to receive approval. Assured access improves operational accuracy; access denial decreases it. It is reasonable to assume that future enemies whose nation and armed forces are not as well technologically "connected" as the United States and her Allies will work hard to achieve workarounds to our superior information capabilities (assuming our capabilities have measurable superiority). Such workarounds will necessarily involve elaborate deception plans, decoys, false information, and a significant human element. It will involve clandestine or audacious alternatives to maintaining such services as transportation, energy, military platforms, and war materiel, as the Viet Cong and North Vietnamese did. Commercial technology now paces the field in new developments and technology applications, most with useful military application. Enemy courses of action will involve the use of morally difficult asymmetric threats such as placing weapons near hospitals and schools, using "human shields" for their critical systems, or threatening catastrophic damage to the environment. These strategies require our forces to be up close to sense and react swiftly. The ability for operational forces to assure access to sea, space, and cyberspace for the duration of our choosing provides the CINC with options to tailor his response to threats, while access denial will force undesirable courses of action.

Conclusions

In support of our National Security and National Military Strategies, the Navy's operational concept "Forward...From the Sea" declares the necessity to operate and win in the contested littoral areas of the world. Sufficient power projection capability and assured access of the littorals are the cornerstones of this strategic vision. Assured access is defined as "the guaranteed right to approach,

enter, and operate within littoral areas". Inherent in this definition is the ability to assure access at the time of our choosing, for the duration of our choosing.

Operational forces are the enabling elements, and naval forces must assure access to the sea, space, and cyberspace domains or risk jeopardizing our vital national interests. Historical precedent indicates that the success or failure of naval forces to assure access to these domains has non-linear effects upon the success or failure of the campaign, with both theater and national strategic implications. There is also evidence that speed of action is vital to successful combat operations. The increasingly important domain of cyberspace, with its power to facilitate ever increasing shared awareness between forces, is a warfighting domain of increasing importance. For naval forces, the interdependence of the three domains requires their combined assured access in order to maximize the probability and timeliness of successful combat operations. This interdependence will only increase in the future, as our dependence upon fast, relevant, and accurate information grows within our operational forces, reflective of society in general. Our military force structure and the strength generated by it also shapes our adversaries' force structures. Potential adversaries will attempt to exploit critical vulnerabilities that our current and planned forces may have through the use of asymmetric threats and workarounds in an attempt to negate our technological advantage. The implication for operational commanders is the necessity to have the correct capability and amount of forces to conduct sustained operations in the littorals. Absent the ideal force for a given situation, the implication is that increased risk must be assumed for the forces on hand to accomplish the mission. Information or knowledge superiority will give the commander a clear advantage in battlespace awareness and is best facilitated by a close proximity to the battlespace. This

proximity, coupled with sufficient sensors, will permit the fastest possible detection and reaction to enemy capabilities. Operational commanders must be willing to risk a close proximity to the enemy with the increase in awareness and speed of action available. A superior naval littoral posture may in the end act as sufficient deterrence to nations undecided on a chosen method by which to influence events locally.

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